

REMARKS

Entry of the foregoing, reexamination and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 1-15, 18-24, 26 and 27 were pending. By the present response, claim 28 has been added. Thus, upon entry of the present response, claims 1-15, 18-24 and 26-28 are pending and await further consideration on the merits.

Support for the foregoing amendments can be found at least the following locations in the original disclosure: [0013], Figure 1A; and the original claims.

Entry of the foregoing is appropriate pursuant to 37 C.F.R. §1.116 for at least the following reasons: the foregoing amendments do not necessitate a new search; clearly act to introduce allowable subject into the application; and places the application in better form for an appeal.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 1, 5, 9, 12-15, 18, 21, 23-24 and 27 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 3,164,888 to Sharrow et al. (hereafter "*Sharrow et al.*") in view of U.S. Patent No. 3,702,499 to Virsbreg (hereafter "*Virsbreg*") on the grounds set forth in paragraph 5 of the Official Action. This rejection is respectfully traversed.

The present invention is generally directed to a method for insulating a stator bar of a rotating electrical machine. According to the principles of the present invention, a shrink-on sleeve is prefabricated with a rectangular cross-section, which

then is applied to a conductor bar also having a rectangular cross-section. This technique advantageously causes the shrink-on sleeve to hug the connector bar at each point without forming wrinkles or voids, thus presenting a potential interruption in the insulating properties thereof, and also prevents potential tearing or ripping of the shrink-on sleeve at the relatively sharp edges of the rectangular bar. (See, e.g., paragraphs [0009] and [0013].)

A method performed according to the principles of the present invention as set forth in claim 1. Claim 1 recites:

*A method for producing an insulated stator winding for a rotating electrical machine, comprising the steps of:
applying at least one electrically insulating shrink-on sleeve with a rectangular cross-section to a periphery of at least one straight electrically conductive conductor bar with a rectangular cross-section; and
shrinking the shrink-on sleeve onto the conductor bar.*

Neither *Sharrow et al.* nor *Virsbreg* disclose, or even suggest, the method of claim 1.

Sharrow et al. is directed to a method of making coils. According to the method described therein, a plurality of conductors (1, 2, 3) which have a glass-based insulation disposed thereon (column 2, lines 32-33) and are bundled together by insulating tubes (5-10) which are shrink fit thereon. However, as evident from claim 1 reproduced above, the presently claimed invention requires applying at least one shrink-on sleeve "to a periphery of at least one straight electrically conductive conductor bar." By contrast, insulating tubes (5-10) of *Sharrow et al.* are not applied to a periphery of the conductor bars. Rather, they are applied directly onto the glass-based insulating material which is disclosed as being disposed on each of the conductors (1, 2, 3). Thus, contrary to the assertions contained at paragraph 5 of

the Official Action, *Sharrow et al.* is deficient in at least this one additional aspect of the presently claimed invention.

Another deficiency of *Sharrow et al.* is expressly acknowledged in paragraph 5 of the Official Action. Namely, *Sharrow et al.* fails to disclose, or even suggest, applying at least one shrink-on sleeve with a rectangular cross-section to a periphery of at least one electrically conductive conductor bar. In the Official Action it is noted that the insulating tubes (5-10) are referred to as "sleeve 5, 6, 7, 8, 9, 10 and 11." It is further alleged that *Sharrow et al.* is "silent" with regard to applying a shrink-on sleeve to the conductor bar having a rectangular cross-section. However, it should be noted that *Sharrow et al.* does not describe members (5-10) as "sleeves." Rather, *Sharrow et al.* describes them as "tubes." Thus, to the extent that the teachings of *Sharrow et al.* imply anything with regard to the cross-section of the shrink-on tubes described therein, it would imply to one of ordinary skill in the art that these tubes have a circular cross-section.

Moreover, it is noted that *Sharrow et al.* does nothing to address the problem of splitting or tearing of insulation material by the sharp corners of a rectangular conductor bar. To the contrary, as abundantly clear from the disclosure of *Sharrow et al.*, the insulating tubes (5-10) disposed on the conductor (1-3) only serve to contain the glass-based insulating material which is prone to splitting upon coiling of the rectangular conductor (1-3) upon forming a coil (see, e.g., column 4, lines 31-37).

With respect to newly added claim 28, it is noted that this newly presented claim is also distinguishable over the teachings of *Sharrow et al.* for at least the same reasons noted above. Newly presented claim 28 is even more clearly distinguishable by virtue of the fact that it requires applying at least one shrink-on

sleeve with a rectangular cross-section "directly to a periphery of at least one straight electrically conductive conductor bar."

Virsbreg is directed to a method of manufacturing a coil comprising several turns of an insulated conductor. The coil is then surrounded by a shrink tube (5). It is alleged in paragraph 5 of the Official Action that *Virsbreg* discloses a shrink sleeve having a rectangular cross-section. This assertion is respectfully traversed. In particular, with respect to the sleeve (5a) depicted in Figure 1B, applicants note that the sleeve depicted therein has rounded inner corners, rather than angular inner corners, and thus would be predicted to suffer the same detriment as the conventional technologies, namely, being subject to splitting or tearing upon application to a conductor bar having a rectangular cross-section with relatively sharp corners.

It is further alleged in paragraph 5 of the Official Action that:

It is known in the stator winding for rotating electrical machine art to apply insulation in the form of a heat-sink sleeve to a conductor bar where the shrink sleeve can have a circular cross-section 5 if the conductor bar as a circular cross-section or a rectangular cross-section 5a if the conductor bar as a rectangular cross-section, as taught by *Virsbreg* . . .

This interpretation of the teachings of *Virsbreg* is simply incorrect. Figures 1a-1b are cross-sectional views taken along line A-A of Figure 1 (column 3, lines 6-8). As readily apparent from Figure 1, the cross-section at A-A does not illustrate any part of the conductor (1). Rather, the components illustrated as being disposed within the tube (5, 5a) of Figures 1a-1b are guide elements (e.g., 8, 9, 2a) of the frame (2). Thus, contrary to the insertions contained in paragraph 5 of the Official Action, *Virsbreg* does not disclose or even suggest surrounding a rectangular conductor bar with a rectangular sleeve. As noted above, the tube (5, 5a) is

disclosed by *Virsbreg* as being disposed about a coil of a conductor wire (1) having several turns. In addition to the reasons noted above, this distinction is important to note because it is clear that *Virsbreg* is not concerned about applying a rectangular tube to a rectangular, straight conductor bar having a rectangular cross-section. The conductor (1) of *Virsbreg* can suitably comprise a circular cross-section, yet be wound in a coil within the frame (2) and then surrounded by an appropriate sleeve. However, there is clearly no dependence, or relationship acknowledged, between the cross-section of the coiled conductor wire (1) of *Virsbreg* that goes into making up the coil, and the outer sleeve (5,5a) which then surrounds the as-formed coil.

Applicants previous assertions with respect to the teaching of *Virsbreg* of applying a tube to a coil is acknowledged in paragraph 15 of the Official Action.

However, applicants previous remarks are then dismissed on the basis that:

Virsbreg is now only being used [sic: as] a secondary reference to show it [sic: as] being known in the stator winding for rotating mechanical machine art to apply insulation in the form of a heat-shrink sleeve to a conductor bar where the shrink sleeve can have a circular cross-section 5 if the conductor bar as a circular cross-section or a rectangular cross-section 5a if the conductor bar has a rectangular cross-section. (Emphasis added.)

The above-quoted commentary clearly indicates that the Examiner has improperly failed to consider the teachings of *Virsbreg* as a whole, as including those portions contained therein which would lead one of ordinary skill in the art away from the presently claimed subject matter. *In re Gurley*, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994).

For at least the reasons noted above, *Sharrow et al.* and *Virsbreg*, taken alone or in combination, fail to disclose or suggest the subject matter of claim 1. The remaining claims depend either directly or indirectly upon claim 1. Thus, these

claims are also distinguishable over *Sharrow et al.* and *Virsbreg* for at least the same reasons previously noted.

Claims 1, 5, 9, 12-15, 18, 21, 23-24 and 27 stand rejected under 35 U.S.C. §103(a) as being obvious over *Sharrow et al.* in view of U.S. Patent No. 5,661,842 to Faust (hereafter "*Faust*") and/or European Patent Application Publication No. EP 0530952 (hereafter "*EP 952*") on the grounds set forth in paragraph 6 of the Official Action. This rejection is respectfully traversed. The distinctions between claim 1 and newly presented claim 28 and the teachings of *Sharrow et al.* are set forth above, and incorporated herein by reference.

It is alleged in paragraph 6 of the Official Action that:

It would have been obvious to the skilled artisan at the time of the invention to use a shrink sleeve with a rectangular cross-section for that of Sharrow because such a shrink sleeve is known in the art for insulating conductors, as taught by Faust . . . and/or Lambert . . .

This assertion is respectfully traversed.

Faust is directed to a method for providing a protected submarine cable joint. As such, one of ordinary skill in the art would never have been motivated to turn to the teachings contained therein in any attempt to modify the teachings of *Sharrow et al.*, which are directed to an entirely different art (the formation of armature coils for dynamo-electric machines). *In re Wood*, 202 USPQ 171, 174 (C.C.P.A. 1979). Specifically, it is noted that the environment within a rotating electrical machine that a conductor bar must function is entirely different from the environment of a submarine cable joint. For example, rotating electrical machines produce large mechanical and thermal stresses on the materials contained within the motor assembly. By contrast, the cable joint of *Faust* is a relatively static structure and, would not be expected to address the same types of operating conditions. There is

simply no reason for one of ordinary skill in the art to have sought out the teachings of *Faust* in an attempt to modify the teachings of *Sharrow et al.* Thus, the rejection is, at a minimum, improper on this basis.

While *Faust* mentions in passing that the protective coverings (20, 25) can have a rectangular cross-section (column 5, lines 10-12), it should be noted that nowhere does *Faust* disclose that the member disposed within these protective coverings have a rectangular cross-section as required by the presently claimed invention. To the contrary, nowhere does *Faust* disclose, or even suggest, that rectangular cables be encapsulated with a rectangular sleeve. To the contrary, the only form of cable connection that is disclosed by *Faust et al.* is a cylindrical cable connection (30, 10, 35). Thus, contrary to the above-quoted assertion contained in paragraph 6 of the Official Action, *Faust* does not disclose, or even suggest, applying a rectangular shrink sleeve to a conductor bar having a rectangular cross-section.

Applicants' previous remarks concerning the fact that *Faust* is directed to non-analogous prior art is acknowledged in paragraph 16 of the Official Action.

However, applicants' previous remarks are dismissed on the basis that:

Faust was only used to show it being known in the shrink sleeve art to use a shrink sleeve having a rectangular cross-section as an alternative to one having a circular cross-section when insulating an electrically conductive member.

The above-quoted commentary clearly illustrates that the Examiner has (1) improper failed to consider the teachings of the prior art reference as a whole; and (2) failed to comprehend the concept of non-analogous prior art. The central principle behind non-analogous prior art, is that one of ordinary skill in the art would not have looked to the teachings of *Faust*, for any purpose, if it is concluded that

Faust is directed to a different field of endeavor and the teachings of the reference are not reasonably pertinent to the particular problem with which the invention is directed. *In re Wood*, 202 USPQ 171, 174 (C.C.P.A. 1979).

EP '952 is directed to a cover assembly of expanded elastomeric tubing having a frangible support core structure. The assembly of *EP '952* is taught as being applicable to "insulate and environmentally seal a bare wire connection or splice which is part of an electrical circuit or wire harness" (column 2, lines 34-36). Again, *EP '952* is non-analogous prior art when compared with either the claimed invention or the technology discussed in *Sharrow et al.* As such, one of ordinary skill in the art would never have turned to the teachings of *EP '952* in an attempt to modify the teachings of *Sharrow et al.* As previously noted herein, the environment within which a conductor bar having a rectangular cross-section is intended to operate within a dynamic electrical motor is significantly different from a static electrical connection which is part of an electrical circuit or wire harness. Clearly, *EP '952* is not only directed to a separate field of endeavor, it is also not reasonably related to the particular problems to which the presently claimed invention is directed. Thus, the rejection is improper for at least this reason.

Figure 8 of *EP '952* is cited as allegedly teaching application of a shrink sleeve having a rectangular cross-section to a member contained therein. This assertion is factually incorrect. As clearly explained on lines 20-23 of column 6, the member 38 depicted in Figure 8 of *EP '952* is a frangible core, and not a shrink sleeve, contrary to the assertions contained in paragraph 6 of the Official Action. *EP '952* is silent with regard to whether a rectangular shrink sleeve is applied to the outer periphery of such a frangible core member.

To reiterate, one of ordinary skill in the art would not have turned to the teachings of *Faust* and *EP '952* in an attempt to modify the teachings of *Sharrow et al.* Further, *Faust* does not disclose what is alleged in paragraph 6 of the Official Action, namely, *Faust* does not teach application of a rectangular shrink sleeve to a rectangular conductor disposed therein. Similarly, *EP '952* does not teach application of the shrink sleeve having a rectangular cross-section to another member disposed therein, also having a rectangular cross-section. The interpretation of the teachings of these two references as stated in the grounds for rejection are factually incorrect. Thus, the rejection is improper and must be withdrawn.

For at least the reasons noted above, claim 1 is distinguishable over the teachings of *Sharrow et al.*, *Faust* and/or *Lambert*. The remaining claims depend either directly or indirectly upon claim 1. Thus, these claims are also distinguishable over the applied prior art for at least the same reasons.

Claims 2-3 and 6 stand rejected under 35 U.S.C. §103(a) as being obvious over *Sharrow et al.* in view of *Virsbreg* or *Sharrow et al.* in view of *Faust* and/or *Lambert*, as set forth above, and further in view of the "*Admitted Prior Art*" and the teachings of *Virsbreg*.

Initially, with respect to the alleged "*Admitted Prior Art*" it is noted that applicants' own disclosure cannot be used to support a rejection of claims absent an admission that the matter disclosed in the specification is in the prior art. It is respectfully submitted that the current specification contains no such admission. *In re Wertheim*, 191 USPQ 90, 102 (C.C.P.A. 1976). Thus, the rejection is improperly based upon applicants' own specification.

The alleged "*Admitted Prior Art*" is applied as allegedly teaching mechanically dilating a shrink sleeve in its cold state and applying the sleeve around an outer periphery of a support sleeve, removing the support sleeve from between the insulating shrink-on sleeve and the article, and dilating the sleeve with compressed air and pulling the sleeve in a cold state over the conductor bar. However, even if the "*Admitted Prior Art*" was applied in the manner suggested, the previously noted deficiencies in connection with the principle combinations of prior art references discussed above, would not be cured. Thus, claims 2-3 and 6 are also distinguishable over the above-stated grounds for rejection for at least the same reasons previously noted herein. Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 4, 20 and 26 stand rejected under 35 U.S.C. §103(a) as being obvious over *Sharrow et al.* in view of *Virsbreg* or *Sharrow et al.* in view of *Faust* and/or *Lambert*, and further in view of the "*Admitted Prior Art*," *Virsbreg*, U.S. Patent No. 4,135,553 to Evans (hereafter "*Evans*") and finally U.S. Patent No. 5,624,618 to Forman et al. (hereafter "*Forman et al.*") on the grounds set forth in paragraph 8 of the Official Action. This combination of 6-7 prior art references is clearly the result of an improper hindsight reconstruction of the prior art.

Evans and *Forman et al.* are applied as alleging teaching removing a support from a shrinkable sleeve by dissolving the support in a solvent (*Evans*), removing a support by melting the support (*Forman et al.*), forming a support from a polymeric material (*Evans* and *Forman et al.*), and adhering a softened support sleeve on the surface of the conductor bar (*Evans* and *Forman et al.*). However, even if the teachings of *Evans* and *Forman et al.* were applied in the manner suggested, the

previously noted deficiencies contained in the principle combinations of prior art references would not be cured. Thus, claims 4, 20 and 26 are also distinguishable over the above-stated grounds for rejection for at least the same reasons previously noted herein. Reconsideration and withdrawal of the rejection is respectfully requested.

In addition, *Evans* and *Forman et al.* are non-analogous prior art. *Evans* is directed to a recoverable sleeve which does not require the application of heat for recovery in which is held in a recoverable position by an external restraint, for the purposes of repairing or splicing and electrical conductor (column 1, lines 10-12; and column 1, line 66-column 2, line 3). *Forman et al.* is directed to a braided composite part of a gas turbine engine having a complex geometry (column 1, line 62-column 2, line 4). Thus, neither reference is within the same field of endeavor, or is reasonably related to the particular problems addressed by the present invention. Therefore, the rejection is improper for least this additional reason.

Claims 7-8 and 22 stand rejected under 35 U.S.C. §103(a) as being obvious over *Sharrow et al.* in view of *Virsbreg* or *Sharrow et al.* in view of *Faust* and/or *Lambert* as previously set forth, and further in view of U.S. Patent No. 4,589,939 to Mohebban et al. (hereafter "*Mohebban et al.*") on the grounds set forth in paragraph 9 of the Official Action.

Mohebban et al. is applied as allegedly teaching the use of a heat shrinkable sleeve having a plurality of radially super imposed layers with different properties and to coextrude the sleeve. However, even if the teachings of *Mohebban et al.* were applied, the claimed invention would not result. Specifically, *Mohebban et al.*

fails to cure the previously noted deficiencies possessed by the principle combination of prior art references set forth above.

In addition, *Mohebban et al.* is directed to insulating multiple-conductor cables used to supply power. Thus, *Mohebban et al.* is not analogous prior art as such one of ordinary skill in the art would not have turned to the teachings of *Mohebban et al.* in an attempt to modify the teachings of the principle combinations of prior references. Thus, the rejection is improper for this additional reason.

Claim 10 stands rejected under 35 U.S.C. §103(a) as being obvious *Sharrow et al.* in view of *Virsbreg* or *Sharrow et al.* in view of *Faust* and/or *Lambert* as set forth above, and further in view of U.S. Patent No. 3,946,480 to Dienes (hereafter "*Dienes*") on the grounds set forth in paragraph 10 of the Official Action. This rejection is respectfully traversed.

Dienes is applied as allegedly teaching the application of adhesive to the inside of the sleeve or outside of the conductor bar. However, even if the teachings of *Dienes* are applied in the manner suggested, the previously noted deficiencies possessed by the principle combinations of prior art references set forth above would not be cured. Thus, claim 10 is distinguishable over the above-stated grounds for rejection for at least the same reasons previously noted herein.

In addition, *Dienes* is directed to an apparatus for use in applying an expandable resilient sleeve to an end-to-end static cable splice. Thus, *Dienes* is clearly directed to non-analogous prior art. Thus, one of ordinary skill in the art would never have turned to the teachings of *Dienes* in an attempt to modify the previously set forth principle combinations of prior art references.

Claim 11 stands rejected under 35 U.S.C. §103(a) as being obvious over *Sharrow et al.* in view of *Virsbreg* or *Sharrow et al.* in view of *Faust* and/or *Lambert*, as set forth above, and further in view of U.S. Patent No. 5,985,062 to Vallauri et al. (hereafter "*Vallauri et al.*") on the grounds set forth in paragraph 11 of the Official Action. This rejection is respectfully traversed.

Vallauri et al. is cited as allegedly teaching the use of an extruded elastomer to form the sleeve. However, even if the teachings of *Vallauri et al.* were applied in the manner suggested, the claimed invention would not result. Namely, *Vallauri et al.* fails to cure the previously noted deficiencies possessed by the principle combinations of prior art references set forth above.

In addition, *Vallauri et al.* is also directed to an end-to-end static cable splice connection. As such, it represents non-analogous prior art. One of ordinary skill in the art would never have turned to the teachings of *Vallauri et al.* in an attempt to modify the principle combinations of prior art references set forth above. Thus, the grounds for rejection are improper for at least this additional reason.

Claim 19 stands rejected under 35 U.S.C. §103(a) as being obvious over *Sharrow et al.* in view of *Virsbreg* or *Sharrow et al.* in view of *Faust* and/or *Lambert*, as set forth above, and further in view of the teachings of the "*Admitted Prior Art*" and *Virsbreg*, as further set forth above, and still further in view of U.S. Patent No. 4,585,607 to Krackeler et al. (hereafter "*Krackeler et al.*") on the grounds set forth in paragraph 12 of the Official Action. This rejection is respectfully traversed.

Krackeler et al. is cited as allegedly teaching removable of the support of helically arranged perforations. However, even if *Krackeler et al.* were applied in the manner suggested, the claimed invention would not result. Namely, *Krackeler et al.*

does nothing to cure the previously noted deficiencies possessed by the principle combinations of prior art references set forth above. Claim 19 is therefore distinguishable over the above-stated grounds for rejection for at least the same reasons previously noted herein.

Krackeler et al. is also directed to an electrical cable splice connection. As such it represents non-analogous prior art such that one of ordinary skill in the art would never have turned to the teachings contained therein in an attempt to modify the principle combinations of prior art references.

CONCLUSION

Entry of the foregoing, reexamination and reconsideration of the subject application are respectfully requested in the light of the amendments above and the comments which follow. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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